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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,960	06/20/2003	Mark W. Kiehl	1-24583	6584
27210	7590	08/14/2006	EXAMINER	
MACMILLAN, SOBANSKI & TODD, LLC ONE MARITIME PLAZA - FIFTH FLOOR 720 WATER STREET TOLEDO, OH 43604				COMPTON, ERIC B
		ART UNIT		PAPER NUMBER
		3726		

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/600,960	KIEHL, MARK W.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Eric B. Compton	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 14 June 2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 13-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 13-17 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date: _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. 6,681,488 to Marando in view of U.S. Pat. 3,631,700 to Kosaka, or in the alternative, Kosaka in view of Marando.

Marando discloses a method of manufacturing a vehicle frame assembly comprising first and second vehicle frame assemblies, which are secured together to form the vehicle frame. See Figure 7. The reference discloses hollow tubular members are placed in forming dies, which are used to deform the members into vehicle frame members. See Figure 1-2. The reference, preferably relies on hydroforming, but does note that other metal deforming techniques can be used. See Col. 5, lines 7-14.

However, the reference does not disclose, "creating a single shock wave within a fluid to rapidly expand the hollow member into conformance with the die cavity."

Kosaka discloses a method member of electrohydraulic forming various members including hollow tubular members. See e.g., Figures 6-8. The method involves:

- a. providing a die cavity (71) having an defined by a die (65, 66);
- b. providing a hollow tubular member (80);

c. positioning said tubular member within said die cavity;  
d. filling said tubular member with a fluid (82);  
e. discharging an electric arc (between electrodes 72 and 72') within said fluid to create a single shock wave (Col. 3, lines 39-40) within said fluid, thereby expanding said tubular member to conform to the shape of the die cavity.

Kosaka discloses the method is an improvement over conventional electrohydroforming process and allows for deformation of workpieces into desired shapes and configurations.

Regarding claim 13, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the tubular vehicle frame of Marando by using a shock wave, in light of the teachings of Kosaka, in order to more easily form the frame members into the desired shape and configuration.

In the alternative, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed hollow vehicle frame members by relying of the hollow member forming method of Kosaka, in light of the teachings of Marando, in order to form members to be used as side rails of a vehicle frame assembly. See e.g., Col. 4, lines 7-9.

Regarding claim 14, Kosaka relies on an electric arc between electrodes (72 and 72').

Regarding claim 17, Marando discloses feeding the tubular member into the die during expansion in order to minimize wall thickness reduction during forming. See Cols. 5-6, lines 62-6.

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3. Claims 13-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. 6,681,488 to Marando in view of GB 1165902 to Hodgson, or in the alternative, Hodgson in view of Marando.

Marando discloses a method of manufacturing a vehicle frame assembly comprising first and second vehicle frame assemblies, which are secured together to form the vehicle frame. See Figure 7. The reference discloses hollow tubular members are placed in forming dies, which are used to deform the members into vehicle frame members. See Figure 1-2. The reference, preferably relies on hydroforming, but does note that other metal deforming techniques can be used. See Col. 5, lines 7-14.

However, the reference does not disclose, "creating a single shock wave within a fluid to rapidly expand the hollow member into conformance with the die cavity."

Hodgson discloses a method member of electrohydraulic forming various members including hollow tubular members. The method involves:

- a. providing a die cavity having an defined by a die (34);
- b. providing a hollow tubular member (36);
- c. positioning said tubular member within said die cavity;
- d. filling said tubular member with a fluid (82);
- e. discharging an electric arc (between electrodes 68a and 68b) within said fluid

to create a single shock wave within said fluid, thereby expanding said tubular member to conform to the shape of the die cavity.

Hodgson discloses the method is an improvement over conventional electrohydroforming process. See Col 2, lines 49-53.

Regarding claim 13, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the tubular vehicle frame of Marando by using a shock wave, in light of the teachings of Hodgson, in order to form more intricate and detailed shaped than merely by hydraulic methods. See *Id.*

In the alternative, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed hollow vehicle frame members by relying of the hollow member forming method of Hodgson, in light of the teachings of Marando, in order to form members to be used as side rails of a vehicle frame assembly. See e.g., Col. 4, lines 7-9.

Regarding claim 14, Hodgson relies on an electric arc between electrodes (68a and 68b).

Regarding claim 17, Marando discloses feeding the tubular member into the die during expansion in order to minimize wall thickness reduction during forming. See Cols. 5-6, lines 62-6.

4. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marando and Kosaka or Hodgson in further view of U.S. Pat. 3,548,630 to Chelminski.

Marando, Kosaka, and Hodgson disclose the invention cited above. However, the references do not disclose forming the shock wave within said fluid by rapidly advancing a piston within a fluid cylinder in communication with said fluid to expand said tubular member to conform to the shape of the die cavity.

Chelminski discloses a method and apparatus for forming material by sudden impulses. "This invention is adaptable to form the material into, against, or around a die

and is also adaptable for the various ways of forming materials, for example, such as bulging, stretching, compacting, extruding, drawing, sizing, expanding, or shrinking.” Col. 1, lines 43-48. The reference discloses that it is an improvement over electrical discharge forming, like disclosed by Kosaka and Hodgson, which required high voltage and the wire must be replaced after each impulse. See Col. 1, lines 54-56. Instead, the reference teaching generating the impulses by rapidly advancing a piston (52) within a fluid cylinder (65) in communication with the fluid (30) to deform the workpiece (W). The apparatus can be adapted for use with present presses. Col. 2, lines 12-15.

Regarding claim 15, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have forming the shock wave of Marando and Kosaka or Hodgson within said fluid by rapidly advancing a piston within a fluid cylinder in communication with said fluid to expand said tubular member to conform to the shape of the die cavity, in light of the teachings of Chelminski, to avoid expendable parts, improve cycle time, and applying consecutive impulses to progressive shape a workpiece. Col. 2, lines 1-12. Furthermore, Chelminski provides a shock wave generating means with improvements over the electrodes of Kosaka and Hodgson.

Regarding claim 16, Chelminski provides for an electromagnet (56), which advances the piston (52).

### ***Response to Arguments***

Applicant's arguments filed June 14, 2006, have been fully considered but they are not persuasive.

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Applicant's sole argument is that Marando and Kosaka/Hodgson are non-analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicants endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

In Marando, a tube (10) is initially provided and formed into a frame member for an automobile. While Kosaka and Hodgson may not necessarily disclose forming frame members for automobiles, they nonetheless teach forming a tubular member into a complex shape. Both Kosaka and Hodgson are silent as to what the tube members deformed are used for. Presumably, the tube members formed would have to be used in some application where a desired shape and/or configuration is necessary. Thus, the references are believed to be analogous to the extent of deforming tubular members into complicated shapes and satisfy the first prong of the *Oetiker* test.

As to the second prong of the *Oetiker* test, Applicant is concerned that conventional hydroforming techniques are not necessarily sufficient for forming automobile frames:

Although the manufacture of vehicle frame components by past hydroforming processes has been satisfactory, the amount of cross-sectional expansion of the tubular member is limited. This is particularly true for metals which are less formable than steel, such as aluminum and magnesium. Thus, it would be desirable to have a method of manufacturing tubular metal vehicle frame components by a hydroforming process permitting greater expansion capabilities of the metal.

Marando requires forming a tubular part having a complicated shape and preferably relies on hydroforming, but does note that other metal deforming techniques can be used. See Col. 5, lines 7-14. Therefore, one having ordinary skill in the art at the time of invention would be motivated to look to other forming techniques (other than hydroforming) which allow for forming tubular workpieces having a complicate shape. Hodgson and Kosaka are two examples of such techniques. Hodgson recognizes the limitations of hydroforming, namely its inability to readily form complex shapes. See Page 1, lines 44-48. Thus, Hodgson relied on an electrohydraulic forming method, like Applicant, to overcome those drawbacks. In Kosaka, the benefits of electrohydraulic forming techniques have been recognized, but notes the drawbacks for complicated parts. Kosaka's electrohydraulic forming method, like Applicant's, allows for more complicated parts. Thus, the references, alternatively, satisfying the second prong of the *Oetiker* test also, since they are reasonably pertinent to the particular problem, which the Applicant was concerned.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (571) 272-4527. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Eric B. Compton

Primary Examiner

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ebc